

**CHUM SALMON GENETIC STOCK IDENTIFICATION;
1996 SOUTH ALASKA PENINSULA POST-JUNE FISHERY SAMPLE COLLECTION**

By

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INTRODUCTION

The harvest of migrant chum salmon, *Onchorhynchus keta*, within the South Alaska Peninsula Management Area, Area M (Figure 1) continues to be spotlighted as a management concern potentially affecting several high profile fisheries. The Alaska Department of Fish and Game (ADF&G) has used genetic stock identification (GSI) methodology to determine the chum salmon stocks harvested in the June South Unimak fishery (Seeb et al. 1995). ADF&G collected GSI tissue samples from the South Unimak June fishery commercial chum salmon catch beginning in 1993 as a pilot study of the South Unimak fishery (Sarafin et al. 1995). The study plan was expanded in 1994, 1995, and 1996 to encompass the South Unimak and the Shumagin Islands fisheries.

The purpose of this project is to sample chum salmon in the post-June fisheries of South Unimak, the Shumagin Islands, and selected mainland areas for GSI studies. Pre-season test fishing was conducted for the post June Shumagin Islands fishery from 12-18 July. The post-June fishery began on 20 July and was open off and on until 10 August.

OBJECTIVES

July test fish catches from the Shumagin Islands were sampled to gain a better understanding of migration patterns of chum salmon stocks found in the South Peninsula Area. Fishery samples were collected to represent the total catch of chum salmon from mainland areas and the Shumagin Islands and will be used to estimate the relative contribution of Pacific Rim chum salmon stocks to the South Peninsula post-June fishery. A comprehensive database including stock groupings from wide geographic areas will be used to describe the chum salmon sampled from the South Peninsula Area harvest (Seeb et al. 1995, Table 1).

METHODS

Fishery Sample Collection

Sampling followed guidelines established in the 1996 Project Operational Plan (Seeb 1996) with the exception of muscle samples collected at Trident Seafoods, Sand Point. Quality control standards at this plant required that muscle samples be taken from the pelvic fin musculature exposed by the belly cut. Samples of pelvic fin muscle were sent to the Genetics Laboratory for testing before we proceeded with the technique.

Fish were selected for sampling without regard to sex, size, or condition. Tissue samples were placed in 2.0 ml cryotubes, placed on wet ice, and frozen as soon as possible in the coldest freezer available at each location. Samples were shipped to the ADF&G Genetics Lab at Anchorage in coolers with dry ice and stored at -80C until laboratory analysis.

Post-June Fishery

The post-June fishery may occur in the Unimak, Southwestern, and Southcentral Districts, the Mainland area of the Southeastern District, and the Shumagin Islands Section of the Southeastern District. Tender

deliveries from the Unimak, Southwestern, and Southcentral Districts were sampled at Peter Pan Seafoods, King Cove and deliveries from the Southeastern and Southcentral Districts were sampled at Trident Seafoods, Sand Point.

Tender operators were interviewed to determine the origin of the catch. The number of fish sampled from each tender was then determined to proportionally represent each tender load as compared to the total catch for that day. At Sand Point, a sampling goal of 150 fish per day was established for the Shumagin Islands fishery, and 50 fish per day for the mainland fishery. At King Cove, the sampling goal was initially set at 150 fish per day but was later increased to 200 per day when it became uncertain that the Sand Point crew would have access to a random representation of fish from mainland areas.

Test fish catches from traditional areas in the Shumagin Islands were sampled from 12 July until 18 July at Sand Point. The sampling goal was 400 fish during this period with immature chum salmon (<400mm) sampled in proportion to their abundance in the catch. After June, there was no test fishing conducted in the South Unimak fishery.

Sampling was done by 2-person crews at each location with the exception of the test fish sampling at Sand Point for which an extra person was added to speed the sampling. Typically, each of the samplers was responsible for all aspects of the sampling procedure. When available, a third crew member kept records, replenished supplies, and cared for samples. Data recording included the date and time of each tender delivery, tender name, origin of catch, and number and/or total weight of chum salmon in the load.

King Cove

Sampling was conducted inside the processing plant at the head of the sorting line. A sampling table fabricated by Peter Pan staff was placed over the sorting line so that the crew members worked on opposite sides of the line facing each other. The table was cleaned with a squeegee between fish and was removed from the line when sampling was completed.

Daily tender delivery schedules including origin of catch, catch composition by weight and species, and expected time of arrival were provided daily by the plant manager. The crew leader also spoke with the plant manager by telephone at about 10:00 pm each evening to confirm the information and make any additions or corrections. Scheduling by Peter Pan Seafoods was for the most part reliable but there were occasional unannounced schedule changes. Sampling proportions were calculated using the daily delivery schedules prior to sampling.

Sand Point

Sampling was conducted on the Trident dock using overturned fish totes as a sampling table. The dock foreman was consulted daily as to where to set up the sampling station. A tote of chum salmon from a selected tender was brought to the sampling station by fork lift. The table was cleaned with a squeegee between fish to avoid cross-contamination of samples.

Trident does not schedule tender deliveries. Often the first tenders to unload were sampled without the benefit of knowing the size, composition, or origin of catch of the remaining inbound tenders. In these instances sampling proportions were figured by guesswork using the best information available. The plant manager and the dock foreman were consulted regularly for the most reliable information. A VHF scanner was also monitored to ascertain tender arrivals.

RESULTS AND DISCUSSION

During the Area M post-June fishery, 6,010 chum salmon were sampled from all districts and the pre-season test fish catch combined. Sampling at King Cove accounted for 3,240 (Table 1). Of these, 551

were from the Unimak District, 1,704 were from the Southwestern District, and 985 were from the Southcentral District. The remaining 2,770 chum salmon were sampled at Sand Point (Table 2). Of these, 1,710 were from the Shumagin Islands, Southeastern District, 210 were from the Southcentral District, 340 were from the Southeastern District Mainland Area, and 510 were from the Shumagin Islands pre-season test fish catch. During test fishing, 21 immature chum salmon were sampled.

King Cove

All of the 3,240 chum salmon sampled from the Unimak, Southwestern, and Southcentral Districts at King Cove were from tender deliveries to Peter Pan Seafoods Inc. Sample size by sampling date and estimated date of catch for each district are shown in Table 1. Openings and closures of districts are included. Sample identification numbers by estimated date of catch for each district are shown in Table 3.

The sampling goal of 150 was not achieved every day because of the speed of the processing line and the lack of workspace in which to stockpile fish to be sampled. Daily sample size ranged from 22 to 290.

The King Cove crew was asked to raise their Southcentral District sampling quota by an additional 50 samples per day beginning 27 July because of problems in receiving ungraded and unsorted loads of chum salmon from the Southcentral District at Sand Point.

Sand Point

A total of 2,770 chum salmon from the Southcentral and Southeastern Districts were sampled from tender deliveries to Trident Seafoods, Sand Point. Sample size by sampling date and estimated date of catch for each district are shown in Table 2. Openings and closures of districts are included. Sample identification numbers by estimated date of catch for each district are shown in Table 4.

The post-June test fishing catch was sampled at the Trident dock at the time of delivery. The test fishing was conducted from 12 July to 18 July with daily sample size ranging from 60 to 100 (Table 2). Immature chum salmon were not a major component of the test fish catch.

The daily sampling goal was not always met because of the uncertainty of arrival times, catch composition, and purity of tender deliveries. Daily sample size ranged from 50 to 400.

The grading of chum salmon prior to sampling proved to be a minor obstacle. This practice did occur occasionally but was accounted for by proportionally sampling "dark" and "bright" chums. As a safeguard, the King Cove sampling crew was directed to increase their sampling quota to 200 chums per day to include more Southcentral District fish in their sampling effort.

RECOMMENDATIONS

The sampling strategies developed for this project will be adequate for 1997 post-June sampling. Planning and preparation should be initiated in March of 1997 to ensure that the necessary arrangements can be made. The Project Operational Plan will need to be modified to reflect the completion of the Area M June fishery sampling as well as any alterations to the post-June study plan.

The installation of personal computers and email at King Cove and Sand Point this year was very beneficial in terms of communication and allowed for feedback from the Kodiak and Anchorage offices directly to the field stations. It also provided a means for daily contact between field stations without the worry of disturbing crew personnel that were on highly irregular schedules. Rod Campbell plans to leave the surplus computer in the bunkhouse to be used for this purpose next year. The laptop computer used at King Cove should be replaced by a more powerful and reliable machine that would enable the crew to complete their data entry in the field.

The data form will be altered to include opening and closing times for each fishing district and to include "sampling date" and "catch date."

Crew size for test fish will drop to two persons in 1997 as the third person was not necessary for the success of the sampling at King Cove or Sand Point this season.

The addition of a single side band radio at Sand Point would eliminate much of the guesswork for arrival times of tenders and calculating sampling proportions as Trident's tender fleet maintains a radio schedule. Tenders are expected to call in their ETA and their catch composition at the evening radio schedule (8:00pm). The frequencies used by Trident are 2427.0 and 4417.0. If a SSB radio could be acquired reasonably, it would be a valuable asset for the Sand Point crew and would improve the accuracy of figuring sampling proportions.

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Table 1. Area M Post-June Chum Salmon GSI Sample Size (N) by Estimated Date of Catch and Date Sampled, King Cove, 1996.

| Date July | Open ^a Un/Sw/Sc | Unimak District | | Southwestern District | | Southcentral District | | TOTALS |
|---------------|-------------------------------|----------------------------|----------------------|----------------------------|----------------------|----------------------------|----------------------|---------------------|
| | | By Est. Date of Catch-N | By Date Sampled N | By Est. Date of Catch-N | By Date Sampled N | By Est. Date of Catch-N | By Date Sampled N | By Date of Catch |
| 20 | o/o/o | 40 | | | | 87 | | 127 |
| 21 | o/o/o | 20 | 40 | 83 | | 70 | 87 | 173 |
| 22 | c9p/c9p/o | | 20 | | 83 | 110 | 70 | 110 |
| 23 | c/c/o | | | | | | 110 | 0 |
| 24 | o7a/o7a/o | 70 | | 140 | | 80 | | 290 |
| 25 | o/o/o | 66 | 70 | 59 ^b | 140 | 75 | 80 | 200 |
| 26 | o/o/o | 70 | 66 | 80 | 59 | | 75 | 150 |
| 27 | o/o/o | | 70 | | 80 | 120 | | 120 |
| 28 | o/o/o | 70 | | 83 | | 47 | 120 | 200 |
| 29 | o/o/o | 125 | 70 | 70 | 83 | 35 | 47 | 230 |
| 30 | c9p/c9p/o | 60 | 125 | 128 | 70 | | 35 | 188 |
| 31 | c/c/o | | 60 | | 128 | 22 | | 22 |
| <u>August</u> | | | | | | | | |
| 1 | o8a/o8a/o | 20 | | 170 | | | 22 | 190 |
| 2 | o/o/o | 10 | 20 | 80 | 170 | 110 | | 200 |
| 3 | o/o/o | | 10 | 160 | 80 | 40 | 110 | 200 |
| 4 | o/o/o | | | 180 | 160 | 20 | 40 | 200 |
| 5 | o/o/o | | | 96 | 180 | 44 | 20 | 140 |
| 6 | o/o/o | | | 130 | 96 | 70 ^c | 44 | 200 |
| 7 | o/o/o | | | 100 | 130 | | 70 | 100 |
| 8 | o/o/o | | | 98 | 100 | 50 | | 148 |
| 9 | o/o/o | | | | 98 | | 50 | 0 |
| 10 | o/o/o | | | 47 | | 5 | | 52 |
| 11 | o/o/o | | | | 47 | | 5 | |
| TOTALS | | 551 | 551 | 1704 | 1704 | 985 | 985 | 3240 |

^a "o" and "c" indicate openings and closures of Unimak/Southwestern/Southcentral districts. Times are included when applicable.

^b Fish sampled on July 26 from the Kona Kai were from Pavlof Bay (Southcentral Dist.) and King Cove Bay (Southwestern Dist.)

^c Fish sampled on August 7, 1996 from the Northern Spirit were from Pavlof Bay (Southcentral District) and Dolgoi (Southwestern District)

Table 2. Area M Post-June Chum Salmon GSI Sample Size (N) by Estimated Date of Catch and Date Sampled, Sand Point, 1996.

| Date July | Open ^a SI/ML/SC ^b | SE District Shumagins | | SE District Mainland | | Southcentral District | | TOTALS |
|---------------|--|----------------------------|----------------------|----------------------------|----------------------|----------------------------|----------------------|---------------------|
| | | By Est. Date of Catch-N | By Date Sampled N | By Est. Date of Catch-N | By Date Sampled N | By Est. Date of Catch-N | By Date Sampled N | By Date of Catch |
| 12 | Test | 60 | 60 | | | | | 60 |
| 13 | Test | 70 | 70 | | | | | 70 |
| 14 | Test | 70 | 70 | | | | | 70 |
| 15 | Test | 70 | 70 | | | | | 70 |
| 16 | Test | 80 | 80 | | | | | 80 |
| 17 | Test | 60 | 60 | | | | | 60 |
| 18 | Test | 100 | 100 | | | | | 100 |
| 19 | c/c/o | | | | | | | |
| 20 | o7a/o/o | 150 | | | | | | 150 |
| 21 | o/o/o | 150 | 150 | | | 50 | | 200 |
| 22 | c9p/o/o | 150 | 150 | 50 | | | 50 | 200 |
| 23 | c/o/o | | 150 | 10 | 50 | 40 | | 50 |
| 24 | c/o/o | | | 50 | 10 | | 40 | 50 |
| 25 | o7a/o/o | 150 | | 10 | 50 | 40 | | 200 |
| 26 | c9p/o/o | 150 | 150 | 50 | 10 | | 40 | 200 |
| 27 | c/o/o | | 80 | | 50 | 50 | | 50 |
| 28 | o7a/o/o | 150 | 70 | 20 | | 30 | 50 | 200 |
| 29 | o/o/o | 150 | 150 | 50 | 20 | | 30 | 200 |
| 30 | c9p/o/o | | 150 | | 50 | | | 0 |
| 31 | c/c/o | | | | | | | 0 |
| <u>August</u> | | | | | | | | |
| 1 | c/c/o | | | | | | | 0 |
| 2 | o/o/o | 160 | | | | | | 160 |
| 3 | c9p/o/o | 100 | 160 | | | | | 100 |
| 4 | c/o/o | | 100 | | | | | 0 |
| 5 | c/o/o | | | | | | | 0 |
| 6 | o/o/o | 184 | | | | | | 184 |
| 7 | c9p/o/o | 216 | 400 | 100 | | | | 316 |
| 8 | c/o/o | | | | 100 | | | |
| TOTALS | | 2220 | 2220 | 340 | 340 | 210 | 210 | 2770 |

^a "o" and "c" indicate openings and closures of districts. Times are included when applicable.^b SI=Shumagin Islands, ML=Southeastern District Mainland Area, SC=Southcentral District.

Table 3. Area M Post-June Chum Salmon GSI Sample Identification Numbers by Estimated Date of Catch, King Cove, 1996.

| Catch Date | N | Sample #'s ¹ | Comments |
|--------------|-------------|--|-------------------------------------|
| 20-Jul | 127 | UN 3001-3040, SC 3041-3127 | Started at #3001 for Post-June fish |
| 21-Jul | 173 | UN 3211-3230, SW 3128-3210, SC 3231-3300 | |
| 22-Jul | 110 | SC 3301-3410 | |
| 23-Jul | | | |
| 24-Jul | 290 | UN 3631-3700, SW 3411-3470, 3551-3630, SC 3471-3550 | |
| 25-Jul | 200 | UN 3776-3840 & 3850, SW 3841-3849, 3851-3900, SC 3701-3775 | |
| 26-Jul | 150 | UN 3981-4050, SW 3901-3980 | |
| 27-Jul | 120 | SC 4051-4170 | |
| 28-Jul | 200 | UN 4171-4240, SW 4288-4370, SC 4241-4287 | |
| 29-Jul | 230 | UN 4406-4530, SW 4531-4600, SC 4371-4405 | |
| 30-Jul | 188 | UN 4601-4660, SW 4661-4788 | |
| 31-Jul | 22 | SC 4789-4810 | |
| 1-Aug | 190 | UN 4981-5000, SW 4811-4980 | Lost #4968-muscle tissue only |
| 2-Aug | 200 | UN 5161-5170, SW 5001-5080, SC 5081-5160, 5171-5200 | |
| 3-Aug | 200 | SW 5241-5400, SC 5201-5240 | |
| 4-Aug | 200 | SW 5401-5530, 5551-5600, SC 5531-5550 | |
| 5-Aug | 140 | SW 5645-5740, SC 5601-5644 | |
| 6-Aug | 200 | SW 5741-5870, SC & SW mix 5871-5940 | |
| 7-Aug | 100 | SW 5941-6040 | |
| 8-Aug | 148 | SW 6091-6188, SC 6041-6090 | |
| 9-Aug | | | |
| 10-Aug | 52 | SW 6189-6235, SC 6236-6240 | |
| TOTAL | 3240 | | |

¹ Abbreviations for fishing districts are UN=Unimak, SW=Southwestern, and SC=Southcentral.

Table 4. Area M Post-June Chum Salmon GSI Sample Identification Numbers by Estimated Date of Catch, Sand Point, 1996.

| Catch Date | N | Sample #'s ¹ | Comments |
|--------------|-------------|--|-------------------------------------|
| 12-Jul | 60 | 3041-3200 | June labels |
| 13-Jul | 70 | 3561-3630 | Post-June labels |
| 14-Jul | 70 | 3631-3700 | |
| 15-Jul | 70 | 3701-3770 | |
| 16-Jul | 80 | 3771-3850 | |
| 17-Jul | 60 | 3851-3910 | |
| 18-Jul | 100 | 3961-4060 | Vials 3911-3960 contain SEM samples |
| 19-Jul | | | |
| 20-Jul | 150 | SI 4061-4210 | |
| 21-Jul | 200 | SI 4211-4360, SC 4361-4410 | |
| 22-Jul | 200 | SI 4411-4560, SEM 4561-4610 | |
| 23-Jul | 50 | SEM 4651-4660, SC 4611-4650 | |
| 24-Jul | 50 | SE 4661-4710 | |
| 25-Jul | 200 | SI 4711-4770, 4821-4910, SEM 4811-4820, SC 4771-4810 | |
| 26-Jul | 200 | SI 4961-5110, SEM 4911-4960 | |
| 27-Jul | 50 | SC 5111-5160 | |
| 28-Jul | 200 | SI 5161-5280, 5331-5360, SEM 5281-5300, SC 5301-5330 | |
| 29-Jul | 200 | SI 5361-5460 & 5471-5520, SEM 5461-5470 & 5521-5560 | |
| 30-Jul | | | |
| 31-Jul | | | |
| 1-Aug | | | |
| 2-Aug | 160 | SI 5561-5720, | |
| 3-Aug | 100 | SI 5721-5820 | |
| 4-Aug | | | |
| 5-Aug | | | |
| 6-Aug | 400 | SI 5821-6220 | |
| 7-Aug | 100 | SEM 6221-6320 | |
| 8-Aug | | | |
| TOTAL | 2770 | | |

¹ Abbreviations for fishing districts are SI= Shumagin Islands, SEM=Southeastern Mainland, and SC=Southcentral.

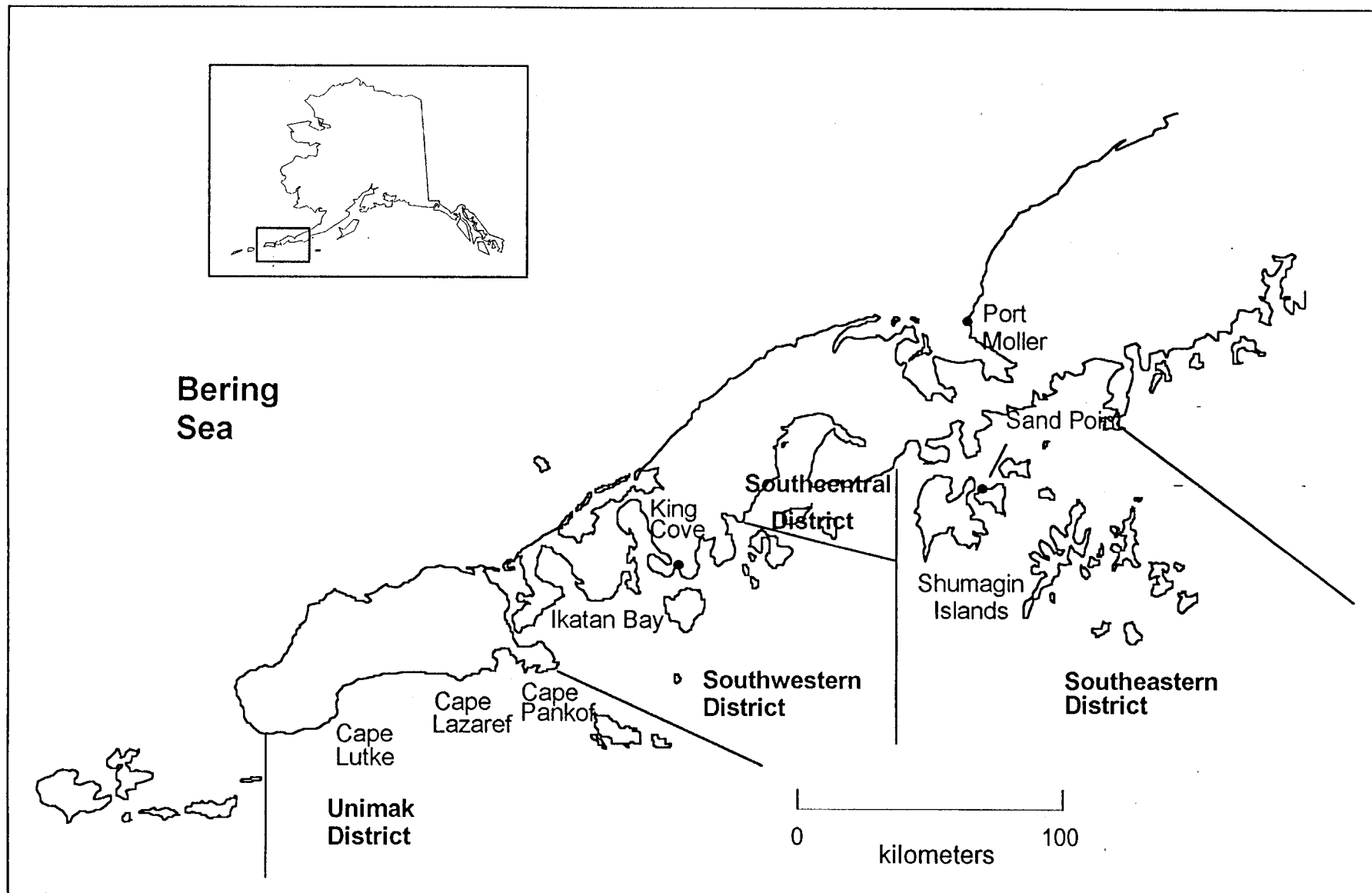


Figure 1. Map of South Alaska Peninsula Management Districts.

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